

Claims (1/3)

1- Confocal optical device for illuminating at least one illuminated point (309) using an
5 illuminating beam coming from an illumination source (300) and focused on the
illuminated point, and for focusing on a microscopic hole (306) a beam to be detected
coming from the illuminated point, comprising a beamsplitter (321) passed through by a
first beam (FD) and reflecting a second beam (FE), one of the first and second beams being
the illuminating beam (FE), and the other being the beam to be detected (FD), the
10 beamsplitter being exchangeable, the device being characterised by the following facts:
- it comprises a redirection mirror (320) substantially parallel to the beamsplitter and
reflecting the second beam,
- the beamsplitter and the redirection mirror are attached to one another,
so that the redirection mirror and the beamsplitter together constitute a splitter unit,
15 intended to be exchanged all in one piece at the time the beamsplitter is exchanged.

2- Optical device according to Claim 1, characterised by the fact that said beamsplitter and
redirection mirror are placed in an afocal zone, in which the illuminating beam and the
beam to be detected are substantially parallel.

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3- Optical device according to either of Claims 1 or 2, characterised by the fact that it
comprises means (801) for illuminating a plurality of illuminated points using a plurality of
illuminating beams, and for focusing on a plurality of microscopic holes (806) a plurality
of beams to be detected each coming from an illuminated point, said beamsplitter being
25 passed through by a plurality of first beams, said beamsplitter and redirection mirror
reflecting a plurality of second beams, said first beams being the illuminating beams and
said second beams being the beams to be detected, or said first beams being the beams to
be detected and said second beams being the illuminating beams.

30 4- Optical device according to one of Claims 1 to 3, characterised by the fact that the
beamsplitter (602) and the redirection mirror (603) are placed on two opposite faces of a
parallel window (600).

5- Optical device according to Claim 4, characterised by the fact that the beamsplitter and the redirection mirror are made by depositions of thin coatings on the parallel window.

6- Device according to either of Claims 4 or 5, characterised by the fact that the parallel
5 window is disposed so that

- the optical path of the second beam (FE) comprises successively a first passing-through of the parallel window, a reflection on a first mirror, a second passing-through of the parallel window, a reflection on a second mirror, and a third passing-through of the parallel window, one of the first and second mirrors being the redirection mirror and the
10 other being the beamsplitter, and

- the optical path of the first beam (FD) comprises a passing-through of the parallel window and a passing-through of the beamsplitter.

7- Device according to one of Claims 1 to 6, characterised by the fact that said beamsplitter
15 is a dichroic mirror and said redirection mirror is a totally reflective mirror.

8- Device according to one of Claims 1 to 7, characterised by the fact that said beamsplitter is a beamsplitter that is neutral as regards wavelength and said redirection mirror is a totally reflective mirror.
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9- Device according to one of Claims 1 to 8, characterised by the fact that it comprises a plurality of splitter units each comprising a beamsplitter and a corresponding redirection mirror, and by the fact that it comprises a means for alternately placing one or another of the splitter units on the optical path.
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10- Device according to Claim 9, characterised by the fact that said means for placing is a slider.

11- Device according to Claim 9, characterised by the fact that said means for placing is a
30 wheel turning about an axis and on which the splitter units are mounted.

12- Splitter unit intended for a confocal optical device according to Claim 1, characterised by the fact that it consists of a parallel window,

- a first face of said window comprising a first area on which a dichroic or partially reflective mirror is made by deposition of at least one thin coating, intended to be passed through by a first light beam and to reflect a second light beam,
- the first face of said window comprising a second non-reflective area, intended to be
5 passed through by the second light beam,
- a second face of said window, opposite to the first face, comprising a third area on which a redirection mirror is made by deposition of at least one thin coating, intended to reflect the second light beam,
- the second face of said window also comprising a fourth non-reflective area, intended to
10 be passed through by the first light beam and by the second light beam.